



*Status of the Claims*

The listing of claims will replace all prior versions, and listings of claims in the application.

1-20 (cancelled)

21. (new) A system for producing a pulse code modulation (PCM) signal, comprising:

    a first filter configured to produce an input signal  $I(n)$  from a secondary audio program (SAP) signal;

    a frequency modulator (FM) including,

        a second filter that generates a quadrature-phase signal  $Q(n)$  from the input signal  $I(n)$ ,

        a FM device configured to generate a frequency modulated signal  $FM(n)$  from the input signal  $I(n)$  and the quadrature-phase signal  $Q(n)$ , and

        a third filter configured to produce the pulse code modulation (PCM) signal.

22. (new) The system of claim 21, wherein the  $FM(n)$  signal equals  $[I(n)Q'(n) - I'(n)Q(n)] / [I^2(n) + Q^2(n)]$ .

23. (new) The system of claim 21, wherein the SAP signal is a constant magnitude signal, a sine wave, or a cosine wave.

24. (new) The system of claim 21, wherein the first filter is a band pass filter.

25. (new) The system of claim 21, wherein the second filter is a Hilbert filter.

26. (new) A FM demodulator, comprising:

a denominator device configured to receive an input signal  $I(n)$  and a quadrature-phase signal  $Q(n)$  to generate a signal  $X(n)$ ;

a denominator calculation device configured to receive the  $X(n)$  signal and generate a  $Y(n)$  signal therefrom;

a numerator calculation device configured to receive the input signal  $I(n)$  and the quadrature-phase signal  $Q(n)$  and to generate numerator signal  $Z(n)$  therefrom; and

a multiplier that is configured to multiply the  $Y(n)$  signal and the  $Z(n)$  signal to produce a  $FM(n)$  signal.

27. (new) The FM demodulator of claim 26, wherein the  $Y(n)$  signal equals  $1/X(n)$ .

28. (new) The FM demodulator of claim 26, wherein the  $X(n)$  signal equals  $I^2(n)+Q^2(n)$ .

29. (new) The FM demodulator of claim 26, wherein the  $Z(n)$  signal equals  $[I(n)Q'(n)-I'(n)Q(n)]$ .

30. (new) The FM demodulator of claim 26, wherein the  $FM(n)$  signal equals  $Y(n)Z(n)=1/X(n) * Z(n)=[1/ I^2(n)+Q^2(n)] * [I(n)Q'(n)-I'(n)Q(n)]$ .

31. (new) A denominator calculating system, comprising:

a multiplication device configured to produce a first signal equal to  $x(n)y(n-1)$ ;

a summation device configured to produce a second signal equal to  $1-x(n)y(n-1)$ ;

a multiplication device configured to produce a third signal equal to  $(1-x(n)y(n-1))a$ ; and

a summation device configured to produce a fourth signal equal to  $y(n-1) + (1-x(n)y(n-1))a$ ,

wherein  $n$  is a positive integer greater than or equal to 0,

wherein  $x(n)$  equals  $I^2(n)+Q^2(n)$ ,

wherein  $y(n)$  equals  $1/x(n)$ ,

wherein  $I(n)$  equals an input signal,

wherein  $Q(n)$  is a quadrature phase signal based on the input signal, and

wherein  $a$  is a scaling coefficient based on a transition speed of  $X(n)$ .